

Table 2-1

**USATEU MINICAMS Soil Screening Results
SAIC Site Investigation
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

Sample Number	Sample Date	Sample Depth	HD	GB	VX
RI - S0101	27-Apr-92	9" - 12"	0.00	0.00	0.00
RI - S0102	27-Apr-92	60" - 67"	0.00	0.00	0.00
RI - S0201	27-Apr-92	9" - 12"	0.00	0.01	0.00
RI - S0202	27-Apr-92	60" - 67"	0.00	0.00	0.00

Notes:

USATEU - United States Army Technical Escort Unit.

MINICAMS - Miniature Continuous Air Monitoring System.

SAIC - Science Applications International Corporation.

Sample Depth given in inches below ground surface.

HD - Distilled mustard.

GB - Sarin.

VX - Nerve agent.

Units are based on time weighted average (TWA) and are equivalent to milligrams per cubic meter (mg/m³).

Reported value is below the 0.8 TWA for the MINICAMS and is not indicative of detected chemical warfare agent.

All data presented is from the 1993 SAIC Site Investigation Report, Fort McClellan, Calhoun County, Alabama.

Table 2-2

**Soil Analytical Results
SAIC Site Investigation
Range I, Parcel 201(7)
Site Investigation
Fort McClellan, Calhoun County, Alabama**

SAIC ID Number				RI-S0101	RI-S0102	RI-S0201	RI-S0202
Depth BLS				1.0	5.0	1.0	5.0
Collection Date				4/27/1992	4/27/1992	4/27/1992	4/27/1992
Associated Field QC Sample				FAS001	FAS001	FAS001	FAS001
				FPR001,2	FPR001,2	FPR001,2	FPR001,2
Parameter	Units	CRL	UCR	RB-006	RB-006	RB-006	RB-006
Method AAA9 (IMPA and MPA in Soil)							
Isopropylmethyl phosphonic acid	µg/g	2.11	40	2.11 LT	2.11 LT	2.11 LT	2.11 LT
Methyl phosphonic acid	µg/g	2.0	40	2.0 LT	2.0 LT	2.0 LT	2.0 LT
Method LL03 (Organosulfur Compounds in Soil)							
1,4 - Oxathiane	µg/g	0.856	17.1	0.856 LT	0.856 LT	0.856 LT	0.856 LT
1,4 - Dithiane	µg/g	1.47	11.3	1.47 LT	1.47 LT	1.47 LT	1.47 LT
p - Chlorophenylmethylsulfoxide	µg/g	2.25	45.0	2.25 LT	2.25 LT	2.25 LT	2.25 LT
p - Chlorophenylmethylsulfone	µg/g	2.37	47.4	2.37 LT	2.37 LT	2.37 LT	2.37 LT
Method LW18 (Thiodiglycol and Chloroacetic Acid in Soil)							
Thiodiglycol	µg/g	3.94	102.0	3.94 LT I	3.94 LT I	3.94 LT I	3.94 LT I
Method TT9 (DIMP and DMMP in Soil)							
Diisopropylmethylphosphonate	µg/g	0.114	4.57	0.114 LT	0.114 LT	0.114 LT	0.114 LT
Dimethylmethylphosphonate	µg/g	0.133	4.18	0.133 LT	0.133 LT	0.133 LT	0.133 LT

Notes:

SAIC - Science Applications International Corporation.

BLS - Below land surface (in feet).

QC - Quality control.

CRL - Certified reporting limit.

UCR - Upper certified range.

µg/g - Micrograms per gram.

LT - Less than the certified reporting limit.

I - Out of control data, rejected due to low recoveries. This flagging code is used when recoveries of the control analytes are depressed so that there is no assurance that values at or near the CRL are accurate.

Data presented is from the 1993 SAIC Site Investigation Report, Fort McClellan, Calhoun County, Alabama.

Table 3-1

**Summary of Data Quality Objectives
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
<u>Contaminant Source</u> Range I, Former Shell Tapping Area Parcel 201(7) <u>Migration Pathways</u> Infiltration to subsurface soil, infiltration and leaching to groundwater, biotransfer to deer (venison), dust emissions and volatilization to ambient air, and runoff and erosion to surface water and sediment <u>Potential Receptors</u> Recreational Site User (current & future) Resident (future) <u>PSSC</u> metals, CWM, and explosives	<u>Surface soil</u>	SI to confirm the presence or absence of contamination in the site media	<u>Surface soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, CWM BD products, and Arsenic speciation for lewisite	Definitive data in CESAS Level B data packages	10 direct-push soil samples + QC
	<u>Subsurface Soil</u>				
	<u>Groundwater</u>	Definitive quality data for future decision-making	<u>Subsurface Soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM BD products	Definitive data in CESAS Level B data packages	10 direct-push soil samples + QC
	<u>Surface Water</u>				
	<u>Sediment</u>		<u>Groundwater</u> TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM BD products	Definitive data in CESAS Level B data packages	4 groundwater samples + QC
			<u>Surface Water</u> TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM BD products	Definitive data in CESAS Level B data packages	3 surface water samples + QC
			<u>Sediment</u> TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, CWM BD Products, TOC, and grain size	Definitive data in CESAS Level B data packages	3 sediment samples + QC

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SAIC - Science Applications International Corporation.

SI - Site investigation.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

USACE - U.S. Army Corps of Engineers.

VOC - Volatile organic compound.

Table 4-1

Sampling Locations and Rationale
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

Sample Location	Sample Media	Sample Location Rationale
RNG-201-MW01	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the north side of Parcel 201(7). The monitoring well will be located on the topographically upgradient side of the site. Sample data will indicate if any contamination detected in groundwater is likely from releases into the environment that have occurred from use of this area or an area upgradient of the site. Soil sample data will indicate if contaminated soil exists at this site and also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and provide information on groundwater quality in the residuum aquifer. Information from the soil boring will be used to establish site-specific geology.
RNG-201-MW02	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the southeast side of the fenced area of Parcel 201(7). Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and provide information on groundwater quality in the residuum aquifer. Information from the soil boring will be used to establish site-specific geology.
RNG-201-MW03	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the southern side of the fenced area of Parcel 201(7). Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and provide information on groundwater quality in the residuum aquifer. Information from the soil boring will be used to establish site-specific geology.
RNG-201-MW04	Surface soil, subsurface soil, and groundwater	Soil boring and monitoring well for surface soil, subsurface soil, and groundwater samples to be placed on the southwestern side of the fenced area of Parcel 201(7). Sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and provide information on groundwater quality in the residuum aquifer. Information from the soil boring will be used to establish site-specific geology.
RNG-201-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed on the western side of the site inside the fenced area of Parcel 201(7). Soil sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at the site. In addition, soil sample data will be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
RNG-201-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the north-central area of the site inside the fenced area of Parcel 201(7). This location will address a mound of soil observed during site reconnaissance conducted at the site. Soil sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at the site. In addition, soil sample data will be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
RNG-201-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the northeastern area of the site inside the fenced area of Parcel 201(7). This location will address a mound of soil observed during site reconnaissance conducted at the site. Soil sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at the site. In addition, soil sample data will be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
RNG-201-GP04	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the southwestern area of the site inside the fenced area of Parcel 201(7). Soil sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at the site. In addition, soil sample data will be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
RNG-201-GP05	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the central area of the site inside the fenced area of Parcel 201(7). This location will address a mound of soil observed during site reconnaissance conducted at the site. Soil sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at the site. In addition, soil sample data will be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
RNG-201-GP06	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be placed in the southeastern area of the site inside the fenced area of Parcel 201(7). This location will address a mound of soil observed during site reconnaissance conducted at the site. Soil sample data will indicate if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at the site. In addition, soil sample data will be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.

Table 4-1

**Sampling Locations and Rationale
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

Sample Location	Sample Media	Sample Location Rationale
RNG-201-SW/SD01	Surface water, sediment	Sample location to the northeast of Parcel 201(7). Samples will be collected from an intermittent tributary of Cane Creek. The sample location is upstream of any surface runoff from the site. Sample data will provide a basis for comparison of downstream samples to indicate if contaminant releases have occurred from runoff in the area of Parcel 201(7). Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
RNG-201-SW/SD02	Surface water, sediment	Sample location to the south-southeast of Parcel 201(7). Samples will be collected from an intermittent tributary of Cane Creek. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 201(7). Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.
RNG-201-SW/SD03	Surface water, sediment	Sample location to the south of Parcel 201(7). Samples will be collected from an intermittent tributary of Cane Creek. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 201(7). Sample data will also be used to assess potential impacts to aquatic biota in the stream and other ecological receptors that may utilize that stream for food and/or habitat purposes.

Table 4-2

Surface Soil and Subsurface Soil Sample Designations and QA/QC Sample Quantities
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
RNG-201-MW01	RNG-201-MW01-SS-HU0001-REG	0-1			RNG-201-MW01-SS-HU0001-MS/MSD	TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-MW01-DS-HU0002-REG	a				
RNG-201-MW02	RNG-201-MW02-SS-HU0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-MW02-DS-HU0004-REG	a				
RNG-201-MW03	RNG-201-MW03-SS-HU0005-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-MW03-DS-HU0006-REG	a				
RNG-201-MW04	RNG-201-MW04-SS-HU0007-REG	0-1	RNG-201-MW04-SS-HU0008-FD			TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-MW04-DS-HU0009-REG	a				
RNG-201-GP01	RNG-201-GP01-SS-HU0010-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-GP01-DS-HU0011-REG	a				
RNG-201-GP02	RNG-201-GP02-SS-HU0012-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-GP02-DS-HU0013-REG	a				
RNG-201-GP03	RNG-201-GP03-SS-HU0014-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-GP03-DS-HU0015-REG	a				
RNG-201-GP04	RNG-201-GP04-SS-HU0016-REG	0-1			RNG-201-GP04-SS-HU0016-MS/MSD	TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-GP04-DS-HU0017-REG	a				
RNG-201-GP05	RNG-201-GP05-SS-HU0018-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-GP05-DS-HU0019-REG	a				
RNG-201-GP06	RNG-201-GP06-SS-HU0020-REG	0-1	RNG-201-GP06-SS-HU0021-FD			TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives and CWM Breakdown products, and Arsenic speciation for lewisite (surface soils only)
	RNG-201-GP06-DS-HU0022-REG	a				

^a Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

CWM - Chemical warfare material.

Table 4-3

**Groundwater Sample Designations and QA/QC Sample Quantities
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
RNG-201-MW01	RNG-201-MW01-GW-HU3001-REG	Groundwater	a			RNG-201-MW01-GW-HU3001-MS/MSD	TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM Breakdown Products
RNG-201-MW02	RNG-201-MW02-GW-HU3002-REG	Groundwater	a	RNG-201-MW02-GW-HU3003-FD			TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM Breakdown Products
RNG-201-MW03	RNG-201-MW03-GW-HU3004-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM Breakdown Products
RNG-201-MW04	RNG-201-MW04-GW-HU3005-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, and CWM Breakdown Products

a - Sample depth will depend on where sufficient first water is encountered to collect a water sample.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

CWM - Chemical warfare material.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

Table 4-4

**Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples		
				Field Duplicates	Field Splits	MS/MSD
RNG-201-SW/SD01	RNG-201-SW/SD01-SW-HU2001-REG RNG-201-SW/SD01-SD-HU1001-REG	Surface Water Sediment	a 0-0.5			RNG-201-SW/SD01-SW-HU2001-MS/MSD RNG-201-SW/SD01-SD-HU1001-MS/MSD
RNG-201-SW/SD02	RNG-201-SW/SD02-SW-HU2002-REG RNG-201-SW/SD02-SD-HU1002-REG	Surface Water Sediment	a 0-0.5			
RNG-201-SW/SD03	RNG-201-SW/SD03-SW-HU2003-REG RNG-201-SW/SD03-SD-HU1003-REG	Surface Water Sediment	a 0-0.5			

^a Actual sample depth selected for analysis will be at the discretion of the site ecological sampler and will be based on field observation.

MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
REG - Field sample.
CWM - Chemical warfare material.
SVOC - Semivolatile organic compound.

TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.

Table 4-4

**Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

Analytical Suite
TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, CWM Breakdown Products, TOC, and Grain Size (sediment only)
TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, CWM Breakdown Products, TOC, and Grain Size (sediment only)
TCL VOCs, TCL SVOCs, TAL Metals, Nitroexplosives, CWM Breakdown Products, TOC, and Grain Size (sediment only)

Table 4-5

**Analytical Samples
Range I, Parcel 201(7)
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples ^a					EMAX	QA Lab
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (0%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	Total No. Analysis
Range I, Former Agent Shell Tapping Area, Parcel 201(7): 7 water matrix samples (4 groundwater samples and 3 surface water samples); 23 soil matrix samples (10 surface soil samples, 10 subsurface soil samples, and 3 sediment samples)													
TCL VOCs	8260B	water	normal	7	1	7	1	0	1	2	1	13	0
TCL SVOCs	8270C	water	normal	7	1	7	1	0	1		1	11	0
Tot TAL Metals	6010B/7000	water	normal	7	1	7	1	0	1		1	11	0
Nitroexplosives	8330	water	normal	7	1	7	1	0	1		1	11	0
CWM BD Products	8270M/8321	water	normal	7	1	7	1	0	1		1	11	0
TCL VOCs	8260B	soil	normal	23	1	23	2	0	1		1	28	0
TCL SVOCs	8270C	soil	normal	23	1	23	2	0	1		1	28	0
TAL Metals	6010B/7000	soil	normal	23	1	23	2	0	1		1	28	0
Nitroexplosives	8330	soil	normal	23	1	23	2	0	1		1	28	0
CWM BD Products	8270M/8321	soil	normal	23	1	23	2	0	1		1	28	0
Arsenic Speciation	8270 MOD	soil	normal	10	1	10	1	0	1		1	14	0
TOC	9060	sediment	normal	3	1	3						3	0
Grain Size	ASTM D-421/D-422	sediment	normal	3	1	3						3	0
Range I, Former Shell Tapping Area, Parcel 201(7) Subtotal:						166	16	0	11	2	11	217	0

^aField duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.

Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to: EMAX Laboratories, Inc.

630 Maple Avenue
Torrance, California 90503
Attn: Elizabeth McIntyre
Tel: 310-681-8889
Fax: 310-618-0818

ASTM- American Society for Testing and Materials.

CWM BD - Chemical Warfare Material Breakdown.

DUP - Duplicate sample.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TAT - Turn-around time.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.